



Credit- Degree applicable

Effective Quarter: Fall 2018

I. Catalog Information

AUTO 67G

Gaseous Fuels

4.5 Unit(s)

Advisory: EWRT 211 and READ 211 (or LART 211), or ESL 272 and 273; MATH 212 or equivalent;

Four and one-half hours lecture (54 hours total per quarter).

Gaseous fuels include Propane, Compressed Natural Gas, liquefied Natural Gas and hydrogen. Propane has been used as an engine fuel for over 80 years. After gasoline and diesel it is the third most popular fuel. It is used to powers over four million vehicles. Compressed Natural Gas, liquefied Natural Gas are being used in many fleet applications and have a large pipeline distribution system. Hydrogen is used in a fuel cell to create electricity and expels water. Two major automobile manufacturers have introduced hydrogen powered cars. As a society we are moving towards having humans have less of an impact on our environment and the gaseous fuel are a big part of the movement.

Course Justification: This is a CSU transferable, stand-alone course. It is intended to better prepare students for work in the automotive industry in the areas of Gaseous fuels systems, as advised by our industry advisory committee.

Student Learning Outcome Statements (SLO)

- **Student Learning Outcome:** Students will interpret the environmental affects gaseous fuel produce and which fuel has the lowest effect on our world. This will be determined with a group of questions on the final exam.

II. Course Objectives

- A. Recognize gaseous fuel safety
- B. Employ high pressure tank testing and certification
- C. Summarize gaseous fuel
- D. Categorize engine design required for gaseous fuels
- E. Practice maintenance requirements for the different gaseous fuels
- F. Discriminate fuel storage and vehicle filling

III. Essential Student Materials

Safety glasses for lab demonstrations

IV. Essential College Facilities

Space for demonstrating gaseous fuels on many different types of equipment, including trucks.

V. Expanded Description: Content and Form

A. Recognize gaseous fuel safety

1. Personal Safety
2. Fuel storage safety
3. Fuel handling safety

B. Employ high pressure tank testing and certification

1. Tank inspection
2. Tank inspection certification training

C. Summarize gaseous fuel

1. Describe Propane use
2. Explain compressed natural gas systems
3. Examine hydrogen as a fuel

D. Categorize engine design required for gaseous fuels

1. Propane engine design and modifications
2. Compressed Natural gas engine design and modifications
3. Fuel cell design and types used in automotive applications

E. Practice maintenance requirements for the different gaseous fuels

1. Route service
2. Understanding the special requirement for gaseous fuels

F. Discriminate fuel storage and vehicle filling

1. On site storage requirements
2. Filling certification
3. Fuel filling Station
4. Fuel filling troubleshooting

VI. Assignments

A. Reading material provided on Course Management System

B. Safety Test to insure personal responsibility in a shop setting

C. 7 worksheets focusing on reading material and problem solving. The worksheets include multiple choice and written sections.

D. Quizzes and tests with clear outcomes that test knowledge retention

VII. Methods of Instruction